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Title/Subject 3-page ltr, T Kwasnoski to RM Batch, K-1030 Recovery System for Carbon Tetrachloride

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K-25 Classification & Information Control Officer Date

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INTER-COMPANY CORRESPONDENCE

(INSERT NAME) COMPANY CARBIDE AND CARBON CHEMICALS DIVISION Union Carbide and Carbon Corporation LOCATION Post Office Box P OAK RIDGE, TENN.

TO R. M. Batch
LOCATION K-1034

DATE 9/3/52

ANSWERING LETTER DATE

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SUBJECT K-1030 Recovery System for Carbon Tetrachloride

KLI-1655

Several problems have recently arisen in the operation of the carbon tetrachloride recovery system in the K-1030 building. This system handles dirty carbon tetrachloride, containing dust, oil, and varnish from the motor cleaning operation performed in that area. The dirty carbon tetrachloride is pumped from the cleaning tank through a bowser filter, and from the filter into a still column. The vapor from the still is condensed into a storage tank and fed back into the cleaning vat.

A problem arose in that the filter was not adequately cleaning the dirty carbon tetrachloride and a material believed to be varnish and oil was baking onto the sides of the still tubes and eventually plugging them entirely. Samples of the filter residue, the tube cake, and the dirty carbon tetrachloride were submitted to the laboratory for analysis and for recommendations as to methods for removing the dust, oil, and varnish from the carbon-tetrachloride before it enters the still.

The analyses performed on the samples are tabulated below:

Residue from filter	21.2 % Ash
Material from tubes	18.6 % Ash
Dirty carbon tetrachloride	1.5 % Ash
	1.0 % solids removed by centrifugation

The following results were obtained when a sample of the dirty carbon tetrachloride was distilled at a temperature of 85° - 95° C.:

Total residue	8 %	by volume
Total residue	5.5 %	by weight
Solid residue	2 %	by volume
Solid residue	1.5 %	by weight

From the ash analyses on the filter residue and the tube cake, it is apparent that the filter is not effectively removing the solid material from the dirty carbon tetrachloride. It should be noted, however, from

the distillation data on the dirty carbon-tetrachloride that the solid residue is only 25% of the total volume of residue left after the carbon tetrachloride has been vaporized, so that a large volume of "gunk" would enter the still even if the filter were 100% effective.

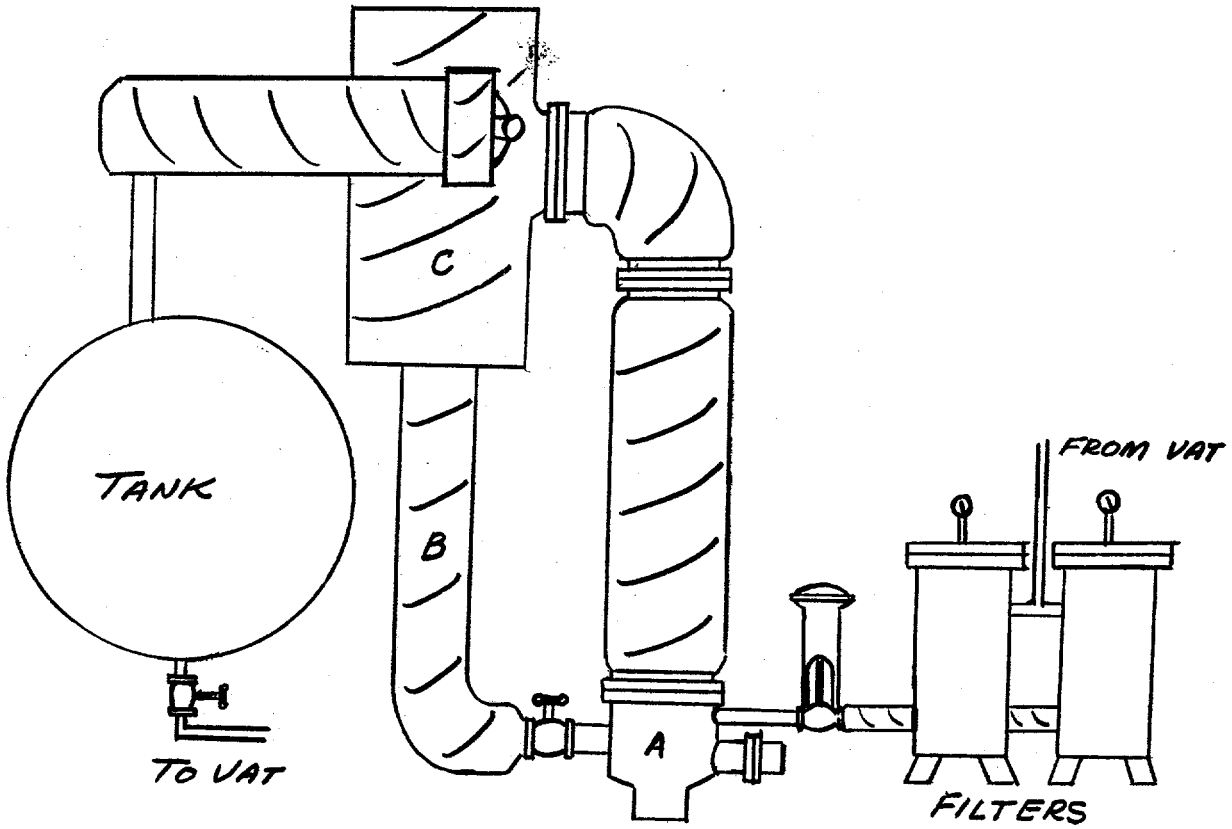
Due to the large volume of the distillation residue involved and to the adherent nature of this residue, it is felt that this recovery could be effected by a simple batch distillation. This proposed change in the operation of the unit would eliminate the filters (see figure 1) and would require a still pot connected at (A) having approximately 50 gallons capacity with a constant-level feed and a hot-water heated jacket. The pot should have a gate valve at the bottom for draining the distillation residue and should be so constructed that the pot could easily be removed for cleaning. The return line (B) from the vaporizer (C) would be disconnected from the still pot. In fact more efficient operation might be obtained by connecting the condenser to the column eliminating the vaporizer completely. This modification would utilize the present still column as a reflux column.

Figure 1

K-1030

CARBON - TETRACHLORIDE

RECOVERY SYSTEM



This unit would process 300 gallons of dirty carbon tetrachloride without filtering, leaving a pot residue of 25 to 30 gallons. Approximately 25% of this residue would be solid and would tend to form a cake on the bottom of the distillation pot. This solid could be removed at frequent intervals during the distillation by flushing through the gate valve with a portion of the dirty carbon tetrachloride or the entire 300 gallons of dirty carbon tetrachloride could be processed and the pot removed and cleaned.

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TK:jd